

# 5KP5.0C SERIES

# BI-DIRECTIONAL TRANSIENT VOLTAGE SUPPRESSOR

**V<sub>RM</sub> : 5.0 - 180 Volts**

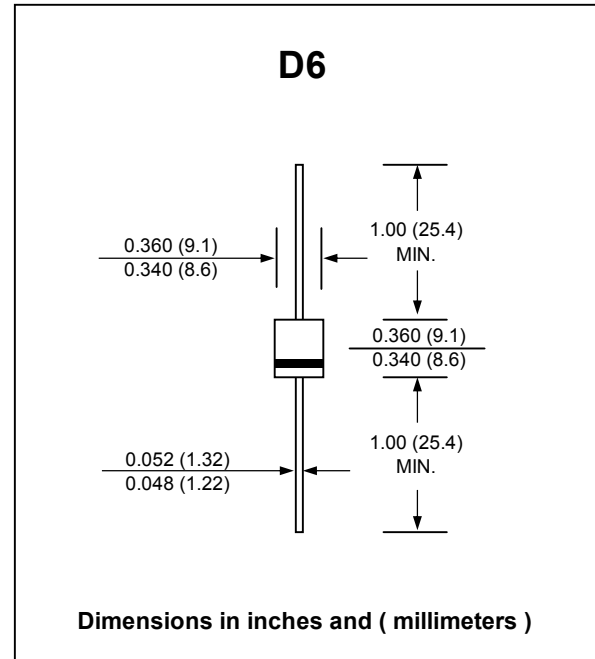
**P<sub>PK</sub> : 5000 Watts**

## FEATURES :

- \* 5000W Peak Pulse Power
- \* Excellent clamping capability
- \* Low incremental surge resistance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V
- \* **Pb / RoHS Free**

## MECHANICAL DATA

- \* Case : Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
- \* Polarity : Cathode polarity band
- \* Mounting position : Any
- \* Weight : 2.1 grams



## DEVICES FOR UNIPOLAR APPLICATIONS

For uni-directional without "C"

Electrical characteristics apply in both directions

## MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

| Rating  | Symbol                            | Value         | Unit |
|---|-----------------------------------|---------------|------|
| Peak Pulse Power Dissipation at tp = 1ms<br>(Note 1, Fig. 4)                                      | P <sub>PK</sub>                   | Minimum 5000  | W    |
| Steady State Power Dissipation at T <sub>L</sub> = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2) | P <sub>D</sub>                    | 8.0           | W    |
| Operating and Storage Temperature Range   | T <sub>J</sub> , T <sub>STG</sub> | - 55 to + 150 | °C   |

### Notes :

- (1) Non-repetitive Current pulse, per Fig. 2 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on Copper Leaf area of 0.79 in<sup>2</sup> (20mm<sup>2</sup>).

## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

| Type     | Breakdown Voltage @ $I_T$<br>( Note 1 ) |      | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse Leakage<br>@ $V_{RM}$ | Maximum<br>Peak Pulse<br>Current (Note2) | Maximum<br>Clamping<br>Voltage @ IPPM | Maximum<br>Temperature<br>Coefficient<br>of $V_{BR}$<br>(%/°C) |       |
|----------|---|------|---------------------------------|--|--|---------------------------------------|--|-------|
|          | $V_{BR}$ (V)                            |      |                                 |  |  |                                       |  | $I_T$ |
|          | Min.                                    | Max. | (mA)                            | (V)                                      | ( $\mu$ A)                               | (A)                                   |  | (V)   |
| 5KP5.0C  | 6.40                                    | 7.30 | 50                              | 5.0                                      | 10000                                    | 520                                   | 9.60   | 0.057 |
| 5KP5.0CA | 6.40                                    | 7.00 | 50                              | 5.0                                      | 10000                                    | 543                                   | 9.20   | 0.057 |
| 5KP6.0C  | 6.67                                    | 8.15 | 50                              | 6.0                                      | 10000                                    | 439                                   | 11.4   | 0.061 |
| 5KP6.0CA | 6.67                                    | 7.37 | 50                              | 6.0                                      | 10000                                    | 485                                   | 10.3   | 0.061 |
| 5KP6.5C  | 7.22                                    | 8.82 | 50                              | 6.5                                      | 4000                                     | 407                                   | 12.3   | 0.065 |
| 5KP6.5CA | 7.22                                    | 7.98 | 50                              | 6.5                                      | 4000                                     | 447                                   | 11.2   | 0.065 |
| 5KP7.0C  | 7.78                                    | 9.51 | 5.0                             | 7.0                                      | 2000                                     | 378                                   | 13.3   | 0.068 |
| 5KP7.0CA | 7.78                                    | 8.60 | 5.0                             | 7.0                                      | 2000                                     | 417                                   | 12.0   | 0.068 |
| 5KP7.5C  | 8.33                                    | 10.2 | 5.0                             | 7.5                                      | 500                                      | 350                                   | 14.3   | 0.073 |
| 5KP7.5CA | 8.33                                    | 9.21 | 5.0                             | 7.5                                      | 500                                      | 388                                   | 12.9   | 0.073 |
| 5KP8.0C  | 8.89                                    | 10.9 | 5.0                             | 8.0                                      | 300                                      | 333                                   | 15.0   | 0.075 |
| 5KP8.0CA | 8.89                                    | 9.83 | 5.0                             | 8.0                                      | 300                                      | 367                                   | 13.6   | 0.075 |
| 5KP8.5C  | 9.44                                    | 11.5 | 5.0                             | 8.5                                      | 100                                      | 314                                   | 15.9   | 0.078 |
| 5KP8.5CA | 9.44                                    | 10.4 | 5.0                             | 8.5                                      | 100                                      | 347                                   | 14.4   | 0.078 |
| 5KP9.0C  | 10.0                                    | 12.2 | 5.0                             | 9.0                                      | 40                                       | 295                                   | 16.9   | 0.081 |
| 5KP9.0CA | 10.0                                    | 11.1 | 5.0                             | 9.0                                      | 40                                       | 325                                   | 15.4   | 0.081 |
| 5KP10C   | 11.1                                    | 13.6 | 5.0                             | 10                                       | 30                                       | 266                                   | 18.8   | 0.084 |
| 5KP10CA  | 11.1                                    | 12.3 | 5.0                             | 10                                       | 30                                       | 294                                   | 17.0   | 0.084 |
| 5KP11C   | 12.2                                    | 14.9 | 5.0                             | 11                                       | 10                                       | 249                                   | 20.1   | 0.086 |
| 5KP11CA  | 12.2                                    | 13.5 | 5.0                             | 11                                       | 10                                       | 274                                   | 18.2   | 0.086 |
| 5KP12C   | 13.3                                    | 16.3 | 5.0                             | 12                                       | 10                                       | 227                                   | 22.0   | 0.088 |
| 5KP12CA  | 13.3                                    | 14.7 | 5.0                             | 12                                       | 10                                       | 251                                   | 19.9   | 0.088 |
| 5KP13C   | 14.4                                    | 17.6 | 5.0                             | 13                                       | 10                                       | 210                                   | 23.8   | 0.090 |
| 5KP13CA  | 14.4                                    | 15.9 | 5.0                             | 13                                       | 10                                       | 232                                   | 21.5   | 0.090 |
| 5KP14C   | 15.6                                    | 19.1 | 5.0                             | 14                                       | 10                                       | 194                                   | 25.8   | 0.092 |
| 5KP14CA  | 15.6                                    | 17.2 | 5.0                             | 14                                       | 10                                       | 215                                   | 23.2   | 0.092 |
| 5KP15C   | 16.7                                    | 20.4 | 5.0                             | 15                                       | 10                                       | 188                                   | 26.9   | 0.094 |
| 5KP15CA  | 16.7                                    | 18.5 | 5.0                             | 15                                       | 10                                       | 206                                   | 24.4   | 0.094 |
| 5KP16C   | 17.8                                    | 21.8 | 5.0                             | 16                                       | 10                                       | 176                                   | 28.8   | 0.096 |
| 5KP16CA  | 17.8                                    | 19.7 | 5.0                             | 16                                       | 10                                       | 192                                   | 26.0   | 0.096 |
| 5KP17C   | 18.9                                    | 23.1 | 5.0                             | 17                                       | 10                                       | 164                                   | 30.5   | 0.097 |
| 5KP17CA  | 18.9                                    | 20.9 | 5.0                             | 17                                       | 10                                       | 181                                   | 27.6   | 0.097 |
| 5KP18C   | 20.0                                    | 24.4 | 5.0                             | 18                                       | 10                                       | 155                                   | 32.2   | 0.098 |
| 5KP18CA  | 20.0                                    | 22.1 | 5.0                             | 18                                       | 10                                       | 172                                   | 29.2   | 0.098 |
| 5KP20C   | 22.2                                    | 27.1 | 5.0                             | 20                                       | 10                                       | 139                                   | 35.8   | 0.099 |
| 5KP20CA  | 22.2                                    | 24.5 | 5.0                             | 20                                       | 10                                       | 154                                   | 32.4   | 0.099 |
| 5KP22C   | 24.4                                    | 29.8 | 5.0                             | 22                                       | 10                                       | 127                                   | 39.4   | 0.100 |
| 5KP22CA  | 24.4                                    | 26.9 | 5.0                             | 22                                       | 10                                       | 141                                   | 35.5   | 0.100 |
| 5KP24C   | 26.7                                    | 32.6 | 5.0                             | 24                                       | 10                                       | 116                                   | 43.0   | 0.101 |
| 5KP24CA  | 26.7                                    | 29.5 | 5.0                             | 24                                       | 10                                       | 128                                   | 38.9   | 0.101 |
| 5KP26C   | 28.9                                    | 35.3 | 5.0                             | 26                                       | 10                                       | 107                                   | 46.6   | 0.101 |
| 5KP26CA  | 28.9                                    | 31.9 | 5.0                             | 26                                       | 10                                       | 119                                   | 42.1   | 0.101 |
| 5KP28C   | 31.1                                    | 38.0 | 5.0                             | 28                                       | 10                                       | 99                                    | 50.1   | 0.102 |
| 5KP28CA  | 31.1                                    | 34.4 | 5.0                             | 28                                       | 10                                       | 110                                   | 45.4   | 0.102 |
| 5KP30C   | 33.3                                    | 40.7 | 5.0                             | 30                                       | 10                                       | 93                                    | 53.5   | 0.103 |
| 5KP30CA  | 33.3                                    | 36.8 | 5.0                             | 30                                       | 10                                       | 103                                   | 48.4   | 0.103 |
| 5KP33C   | 36.7                                    | 44.9 | 5.0                             | 33                                       | 10                                       | 85                                    | 59.0   | 0.104 |
| 5KP33CA  | 36.7                                    | 40.6 | 5.0                             | 33                                       | 10                                       | 94                                    | 53.3   | 0.104 |

## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

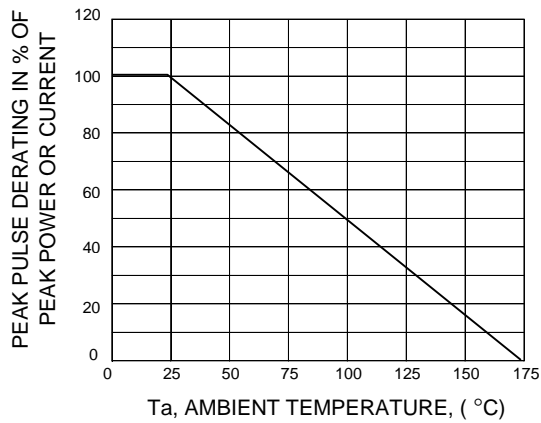
| Type     | Breakdown Voltage @ I <sub>T</sub><br>( Note 1 ) |      | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse Leakage<br>@ V <sub>RM</sub> | Maximum<br>Peak Pulse<br>Current (Note2) | Maximum<br>Clamping<br>Voltage @ I <sub>PPM</sub> | Maximum<br>Temperature<br>Coefficient<br>of V <sub>BR</sub><br>(%/°C) |                 |
|----------|--|------|---------------------------------|---|--|---|---|-----------------|
|          | V <sub>BR</sub> (V)                              |      |                                 |   |  |   |   | V <sub>RM</sub> |
|          | Min.   | Max. | (mA)                            | (V)   | (μA)                                     | (A)   | (V)   |                 |
| 5KP36C   | 40.0   | 48.9 | 5.0                             | 36  | 10                                       | 78  | 64.3  | 0.104           |
| 5KP36CA  | 40.0   | 44.2 | 5.0                             | 36  | 10                                       | 86  | 58.1  | 0.104           |
| 5KP40C   | 44.4   | 54.3 | 5.0                             | 40  | 10                                       | 70  | 71.4  | 0.105           |
| 5KP40CA  | 44.4   | 49.1 | 5.0                             | 40  | 10                                       | 78  | 64.5  | 0.105           |
| 5KP43C   | 47.8   | 58.4 | 5.0                             | 43  | 10                                       | 65  | 76.7  | 0.105           |
| 5KP43CA  | 47.8   | 52.8 | 5.0                             | 43  | 10                                       | 72  | 69.4  | 0.105           |
| 5KP45C   | 50.0   | 61.1 | 5.0                             | 45  | 10                                       | 62  | 80.3  | 0.106           |
| 5KP45CA  | 50.0   | 55.3 | 5.0                             | 45  | 10                                       | 69  | 72.7  | 0.106           |
| 5KP48C   | 53.3   | 65.2 | 5.0                             | 48  | 10                                       | 58  | 85.5  | 0.106           |
| 5KP48CA  | 53.3   | 58.9 | 5.0                             | 48  | 10                                       | 65  | 77.4  | 0.106           |
| 5KP51C   | 56.7   | 69.3 | 5.0                             | 51  | 10                                       | 55  | 91.1  | 0.107           |
| 5KP51CA  | 56.7   | 62.7 | 5.0                             | 51  | 10                                       | 61  | 82.4  | 0.107           |
| 5KP54C   | 60.0   | 73.3 | 5.0                             | 54  | 10                                       | 52  | 96.3  | 0.107           |
| 5KP54CA  | 60.0   | 66.3 | 5.0                             | 54  | 10                                       | 57  | 87.1  | 0.107           |
| 5KP58C   | 64.4   | 78.7 | 5.0                             | 58  | 10                                       | 49  | 103   | 0.107           |
| 5KP58CA  | 64.4   | 71.2 | 5.0                             | 58  | 10                                       | 53  | 94  | 0.107           |
| 5KP60C   | 66.7   | 81.5 | 5.0                             | 60  | 10                                       | 47  | 107   | 0.108           |
| 5KP60CA  | 66.7   | 73.7 | 5.0                             | 60  | 10                                       | 52  | 97  | 0.108           |
| 5KP64C   | 71.1   | 96.9 | 5.0                             | 64  | 10                                       | 44  | 114   | 0.108           |
| 5KP64CA  | 71.1   | 78.6 | 5.0                             | 64  | 10                                       | 49  | 103   | 0.108           |
| 5KP70C   | 77.6   | 95.1 | 5.0                             | 70  | 10                                       | 40  | 125   | 0.108           |
| 5KP70CA  | 77.6   | 86.0 | 5.0                             | 70  | 10                                       | 44  | 113   | 0.108           |
| 5KP75C   | 83.3   | 102  | 5.0                             | 75  | 10                                       | 37  | 134   | 0.108           |
| 5KP75CA  | 83.3   | 92.1 | 5.0                             | 75  | 10                                       | 41  | 121   | 0.108           |
| 5KP78C   | 86.7   | 106  | 5.0                             | 78  | 10                                       | 36  | 139   | 0.108           |
| 5KP78CA  | 86.7   | 95.8 | 5.0                             | 78  | 10                                       | 40  | 126   | 0.108           |
| 5KP85C   | 94.4   | 115  | 5.0                             | 85  | 10                                       | 33  | 151   | 0.108           |
| 5KP85CA  | 94.4   | 104  | 5.0                             | 85  | 10                                       | 36  | 137   | 0.110           |
| 5KP90C   | 100  | 122  | 5.0                             | 90  | 10                                       | 31  | 160   | 0.110           |
| 5KP90CA  | 100  | 111  | 5.0                             | 90  | 10                                       | 34  | 146   | 0.110           |
| 5KP100C  | 111  | 136  | 5.0                             | 100   | 10                                       | 28  | 179   | 0.110           |
| 5KP100CA | 111  | 123  | 5.0                             | 100   | 10                                       | 31  | 162   | 0.110           |
| 5KP110C  | 122  | 149  | 5.0                             | 110   | 10                                       | 26  | 196   | 0.112           |
| 5KP110CA | 122  | 135  | 5.0                             | 110   | 10                                       | 28  | 177   | 0.112           |
| 5KP120C  | 133  | 163  | 5.0                             | 120   | 10                                       | 24  | 211   | 0.112           |
| 5KP120CA | 133  | 147  | 5.0                             | 120   | 10                                       | 26  | 194   | 0.112           |
| 5KP150C  | 167  | 204  | 5.0                             | 150   | 10                                       | 19  | 263   | 0.112           |
| 5KP150CA | 167  | 184  | 5.0                             | 150   | 10                                       | 21  | 242   | 0.112           |
| 5KP160C  | 178  | 217  | 5.0                             | 160   | 10                                       | 18  | 281   | 0.114           |
| 5KP160CA | 178  | 196  | 5.0                             | 160   | 10                                       | 19  | 258   | 0.114           |
| 5KP180C  | 200  | 244  | 5.0                             | 180   | 10                                       | 16  | 316   | 0.114           |
| 5KP180CA | 200  | 221  | 5.0                             | 180   | 10                                       | 17  | 290   | 0.114           |

**Note:**

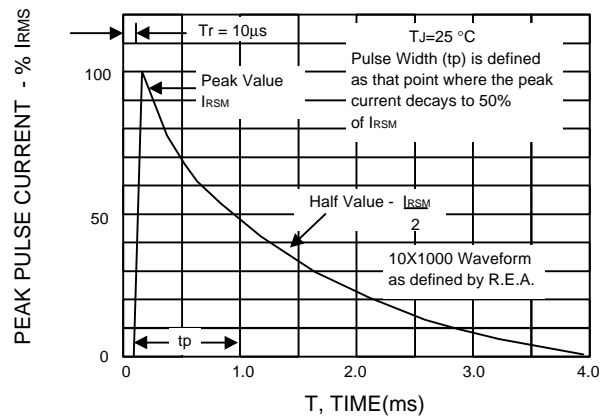
( 1 ) V<sub>BR</sub> measured after I<sub>T</sub> applied for 300 μs., I<sub>T</sub> = square wave pulse or equivalent.

## RATING AND CHARACTERISTIC CURVES ( 5KP5.0C SERIES )

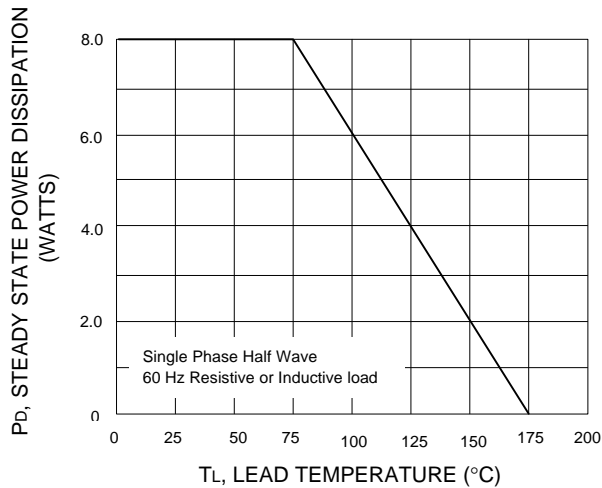
**FIG.1 - PULSE DERATING CURVE**



**FIG.2 - PULSE WAVEFORM**



**FIG.3 - STEADY STATE POWER DERATING**



**FIG.4 - PULSE RATING CURVE**

